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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/724,039 | 12/01/2003 | Jae-Ho Chung | Q78341 | 1546 |

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| EXAMINER | |
|---|---|
| HANNON, CHRISTIAN A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2618 | |

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/724,039 | CHUNG, JAE-HO | |
| | Examiner | Art Unit | |
| | Christian A. Hannon | 2685 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,8,9,13 and 14* is/are rejected.

7)☐ Claim(s) *3-7,10-12,15 and 16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/8/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claim 1 is objected to because of the following informalities: On the sixteenth line of the claim the term '(2w + w)' appears, this is inconsistent with the previously introduced syntax of '(w2 + w)'. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 8-9 & 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Enoki (US 6,014,571).

Regarding claims 1, 8 & 13, Enoki teaches a radio signal parallel processing apparatus which receives and processes in parallel a first carrier signal of a frequency w1 and a second carrier signal of a frequency w2 (Column 5, Lines 6-8; Enoki), the apparatus comprising a first local oscillator (Figure 1, Item 13; Enoki) which outputs a signal LO as an output signal of the first local oscillator (Column 4, Lines 36-37; Enoki), a first frequency mixer which receives the first carrier signal and the signal of the frequency from the LO, and frequency converts the first carrier signal into a first signal of a first intermediate frequency (LO - w1) and a first signal of another first intermediate frequency (LO + w1), and outputs the first signals of the first intermediate frequencies

(LO – w1) and (LO + w1) as output signals of the first frequency mixer (Column 5, Lines 25-27; Enoki) and a second frequency mixer which receives the second carrier signal and the signal of the LO frequency, and frequency converts the second carrier signal into a second signal of a first intermediate frequency (w2 – LO) and a second signal of another first intermediate frequency (w2 + LO) and outputs the second signals for the first intermediate frequencies (w2 – LO) and (w2 + LO) as output signals of the second frequency mixer. Enoki does not explicitly teach that the first and second LO output signals 103 & 104 in figure 1 are the same output frequency, however obvious to one of skill in the art, Enoki would have needed to provide teachings for other circuitry in order to make the two signals 103 & 104 different, therefore it can be concluded that the signals LO from oscillator 13 in figure 1 can be construed as the claims w, or equivalent. It is noted that it would be inherent since Enoki teaches different carrier frequencies that one of the carriers would have to be greater than the other, the examiner is designating the circuit 101a's path to comprise the first frequency mixer and circuit 101b's path to comprise the second frequency mixer as set forth in figure 1. Furthermore it is noted that the examiner is taking the language "in parallel" to be construed as the parallel pictorial architecture of the two received carrier's paths. Finally claims 8 & 13 read as analogous subject matter in method and apparatus form respectively and are therefore being rejected on the same grounds as claim 1, all other dependent claims from 8 and 13 will be rejected similarly as set forth by this statement.

Regarding claims 2, 9 & 14 Enoki teaches the apparatus of claims 1 & 14 and the method of claim 9, in addition Enoki further teaches wherein the frequency w of the

output signal of the first local oscillator is substantially equal to (w2 + w1)/2 which is an average frequency of the frequency w1 and the frequency w2, and (w – w1), which is the first intermediate frequency (w – w1) of one of the output signals of the first frequency mixer, and (w2 – w), which is the first intermediate frequency (w2 – w) of one of the output signals of the second frequency mixer, are each substantially equal to (w2 – w1)/2. Obvious to one of ordinary skill in the art, in order to mix two unique signals (Items 1, 2, Figure 1, Enoki) as to extrapolate data from the signals, an inherent property of the super-heterodyning would require that the LO frequency be "substantially" equal to an average frequency of the two carriers. Otherwise the data would be filtered away in the beating-filtering process.

***Allowable Subject Matter***

4. Claims 3-7,10-12,15-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claims 3, 10 & 15, Enoki teaches a first channel selection filter (Item 11, Figure 1; Enoki) which receives the outputs of the first frequency mixer, removes the first signal of the first intermediate frequency, and outputs the first signal of a first intermediate frequency, as an output signal of the first channel selection filter, wherein the first signal of the first intermediate frequency, is substantially equal to the first signal of the first intermediate frequency, a second channel selection filter (Item 12, Figure 1; Enoki) which receives the outputs of the second frequency

mixer, removes the signal of the first intermediate frequency, and outputs the second signal of the first intermediate frequency as an output signal of the second channel selection filter, wherein the second signal of the first intermediate frequency is substantially equal to the second signal of the first intermediate frequency. However Enoki fails to teach a third frequency mixer which receives the first signal of the first intermediate frequency from the first channel selection filter and the signal of the frequency from the frequency distributor, frequency converts the first signal of the first intermediate frequency into a first signal of a second intermediate frequency and a first signal of another second intermediate frequency, and outputs the first signals of the second intermediate frequencies and as output signals of the third frequency mixer; and a fourth frequency mixer which receives the second signal of the first intermediate frequency from the second channel selection filter and the signal of the frequency from the frequency distributor, frequency converts the first signal of the first intermediate frequency into a first signal of the second intermediate frequency and a first signal of the another second intermediate frequency and outputs the first signals of the second intermediate frequencies as output signals of the fourth frequency mixer, and a frequency distributor which receives the signal of the frequency w from the first local oscillator and outputs a fractional signal of w as an output signal of the frequency distributor. Claims 10 & 15 read as analogous subject matter in method and apparatus form respectively and are therefore being allowed on the same grounds as claim 3.

***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamaguchi et al (US 5,966,666) disclose a multiple-band mobile transceiver having a smaller number of local oscillators.

Mizumoto et al (US 6,393,299) disclose radio communication equipment.

Snider (US 6,804,261) discloses a multi-band receiver having multi-slot capability.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christian A. Hannon whose telephone number is (571) 272-7385. The examiner can normally be reached on Mon. - Fri. 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christian A. Hannon
March 15, 2006

QUOCHIEN B. VUONG
PRIMARY EXAMINER